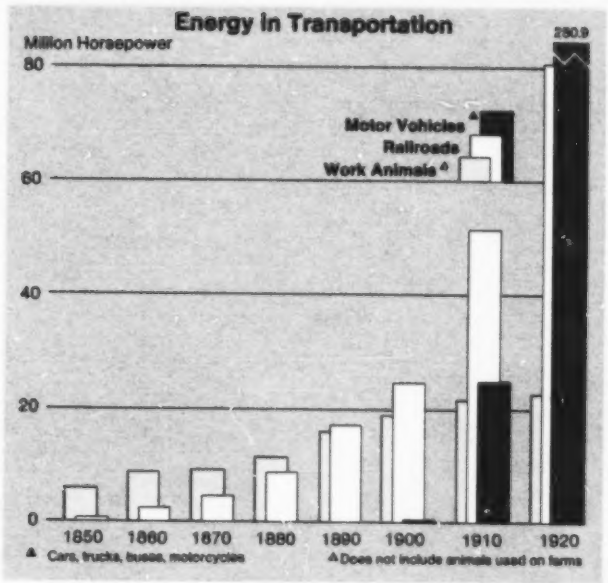
R 4105-5.3

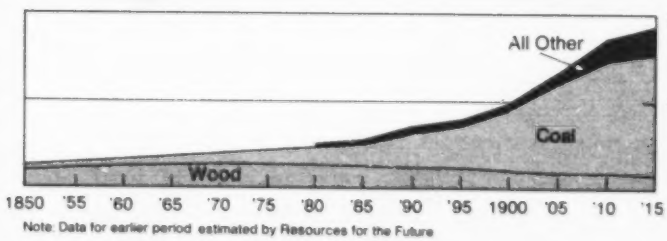
THE CONFERENCE BOARD

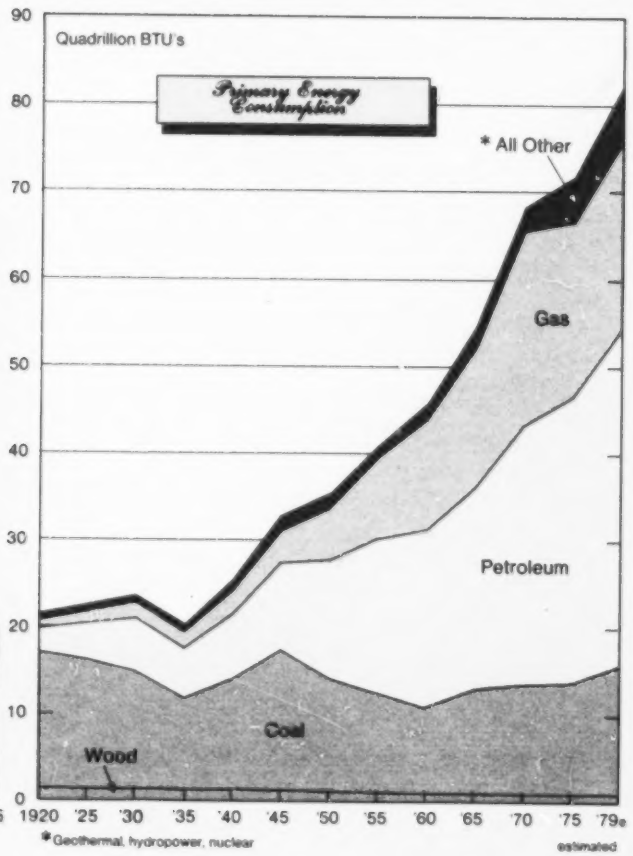
Long Term U.S. Energy Trends

Economic Road Maps
Nos. 1866-1867
November, 1979

Burning fossil fuels, splitting the atom, and exploiting the force of the sun or falling water, all provide the energy that is an essential factor—along with labor and capital—in producing the very high living standard of this country. Helped by improving efficiency in their use, domestic supplies of fossil fuels were adequate for most of our energy needs in the past. But availability, efficient use, and the price of energy have become major and growing concerns, and raise questions about the pace of future improvements in our standard of living.

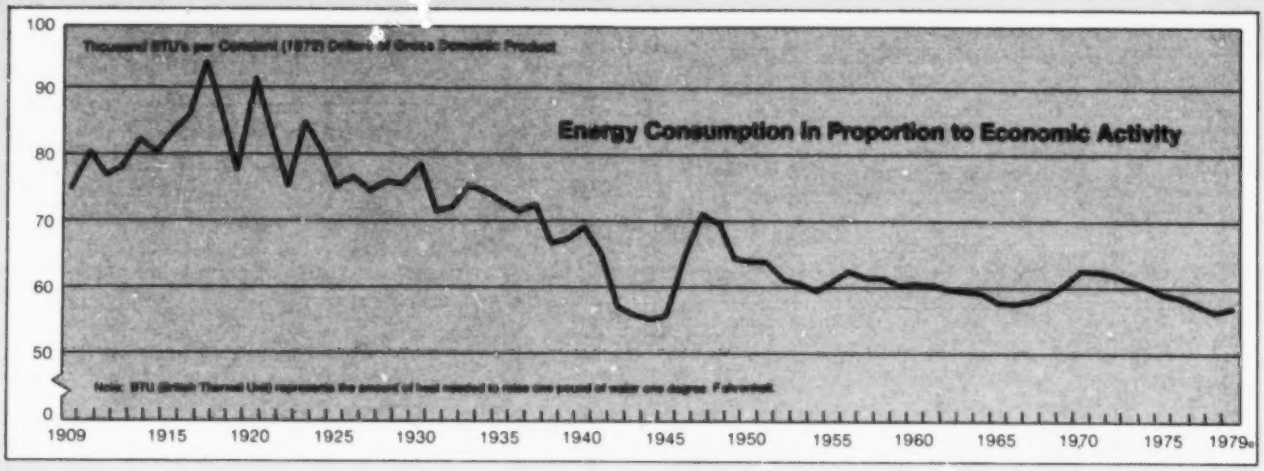



All Other
Coal
Wood
1850 '55 '60 '65 '70 '75 '80 '85 '90 '95 1900 '05 '10 '15
Note: Data for earlier period estimated by Resources for the Future



A century ago, people still depended heavily on wood to heat their homes and cook their food. Wood was also used to power the early railroad engines, as well as in some small-scale processes such as blacksmithing. As late as 1880, wood accounted for more than half of all energy consumed. By that time, however, coal use was expanding rapidly—especially as a power source in the activities that were beginning to develop with the dawning of the modern industrial age. Coal was burned to transform water into steam. The steam, in turn, drove the belts and pulleys that powered both the traditional small textile and shoe factories as well as those turning out such modern products as tractors and railroad cars.

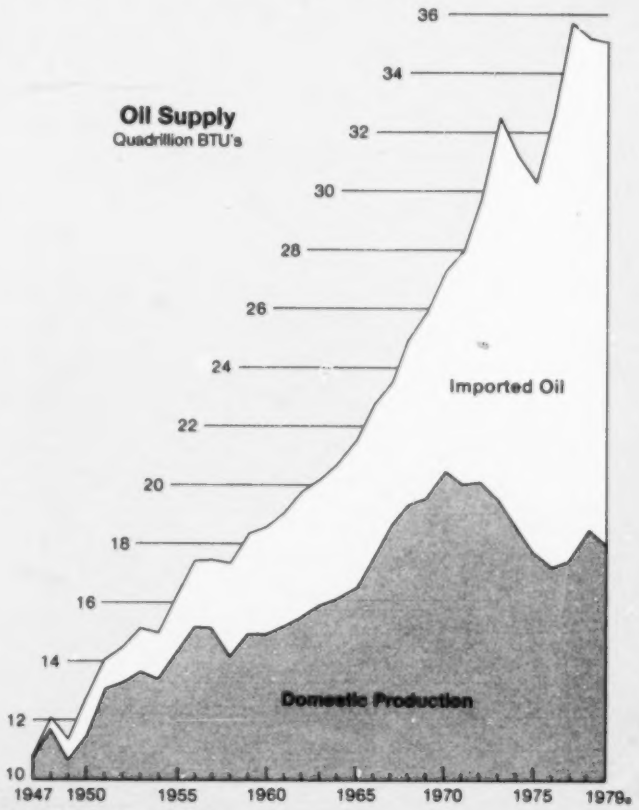
By the turn of the century, steam was being used to generate electricity. The electric motor replaced the cumbersome pulley-and-belt network in the factories. This paved the way for streamlining the production process into modern assembly lines.

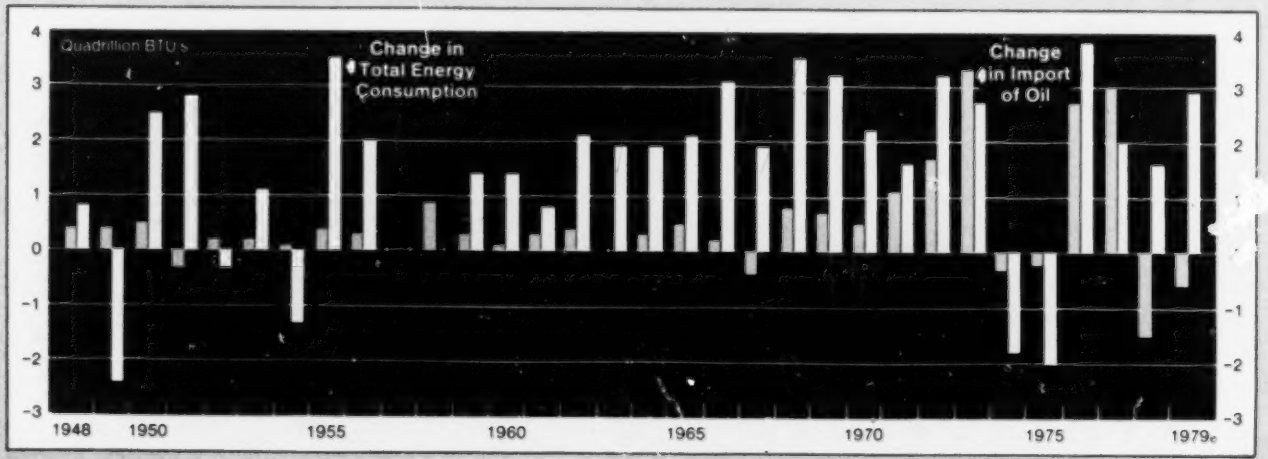


American energy consumption, principally of coal, rose very rapidly throughout the early industrial period. In fact, until about the end of World War I, energy consumption was increasing at a faster pace than the growth in total economic activity. The amount of energy used per unit of real national product increased by 25% from 1909 to 1917. That somewhat overstates the case, in view of the fact that as railroads, and later motor vehicles, replaced horses, mules and oxen, there was a shift from animal power to wood, coal and, later, oil power. Still, the point remains that as these energy supplies became widely available, their prices declined, and use escalated.

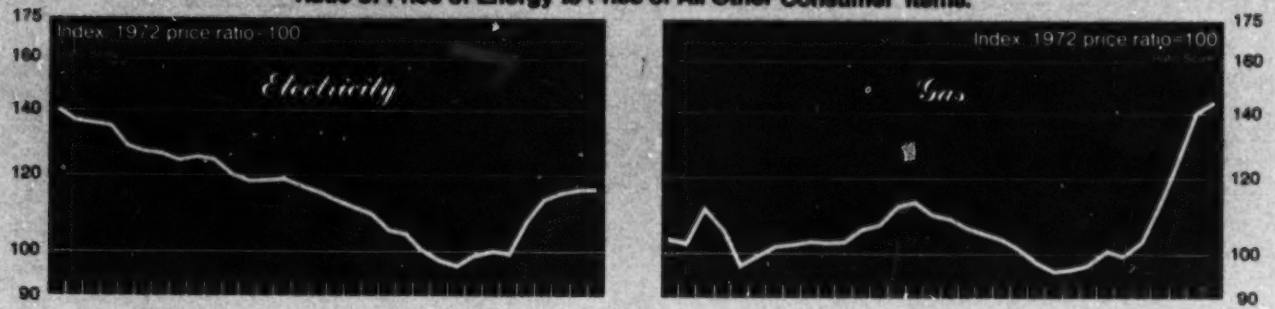
In the era between the two world wars, coal consumption leveled off as the growth of energy demand was increasingly met from domestic production of crude oil and natural gas. Further, the product mix of the economy began to include a higher proportion of consumer goods, which typically required less energy to produce than did heavy industrial goods. Most importantly, however, technological improvements allowed for greater efficiency in fuel usage. The amount of energy used per unit of real national output declined about 40% from 1917 to 1945.

Since the end of World War II, further

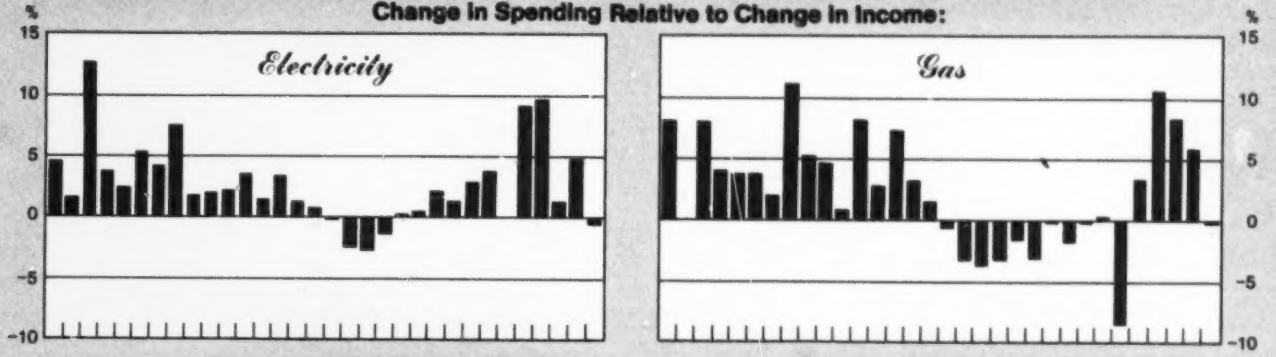




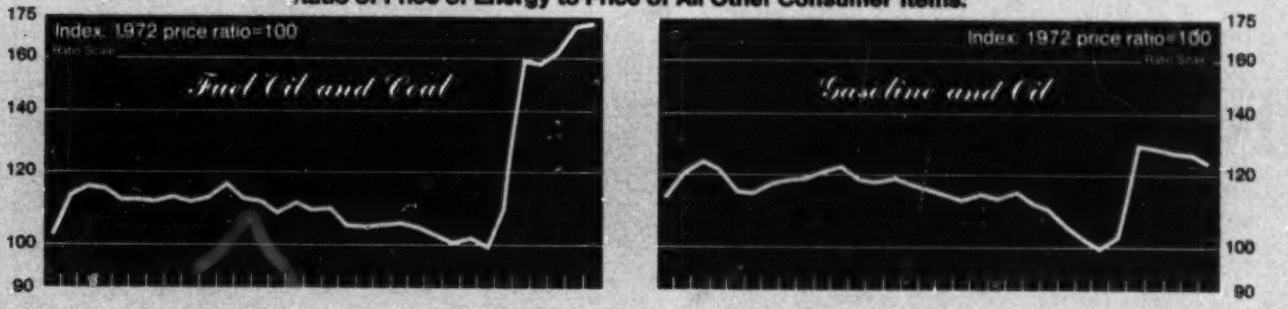
Ratio of Price of Energy to Price of All Other Consumer Items:



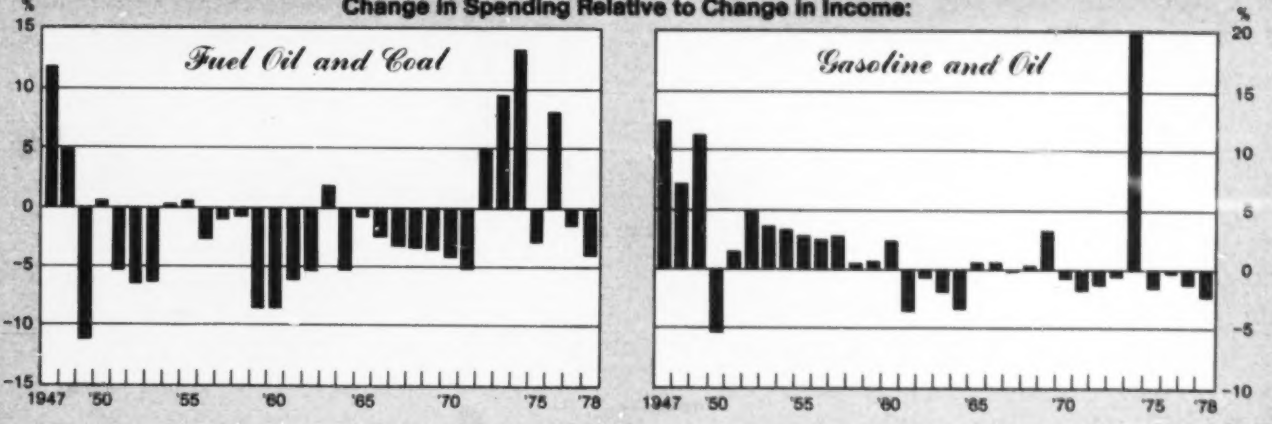
Change in Spending Relative to Change in Income:



Ratio of Price of Energy to Price of All Other Consumer Items:



Change in Spending Relative to Change in Income:



technological improvements in energy use have been achieved, but the energy-to-output ratio has changed very little. To a considerable extent this stability probably reflects the enormous growth in automobile usage in the last 30 years. The price of gasoline—in relation to the price of other consumer goods and services—was declining through about the mid-1960's. That was a major factor in the adoption of the automobile as a basic mode of transportation.

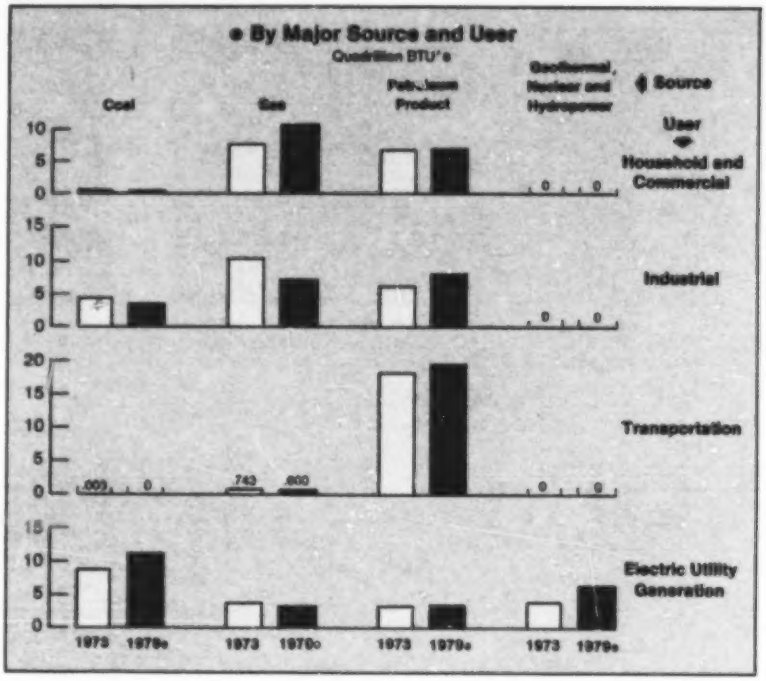
In the last decade, the relative price of petroleum products has been increasing sharply. In addition, imports of petroleum—which began modestly in the 1940's—have been rising steadily as domestic oil production began to diminish after 1970. A steadily rising proportion of total energy consumption has been met by imports of petroleum—at sharply rising prices. The problems of what kinds of energy will be available, at what prices, and from where have become more acute and

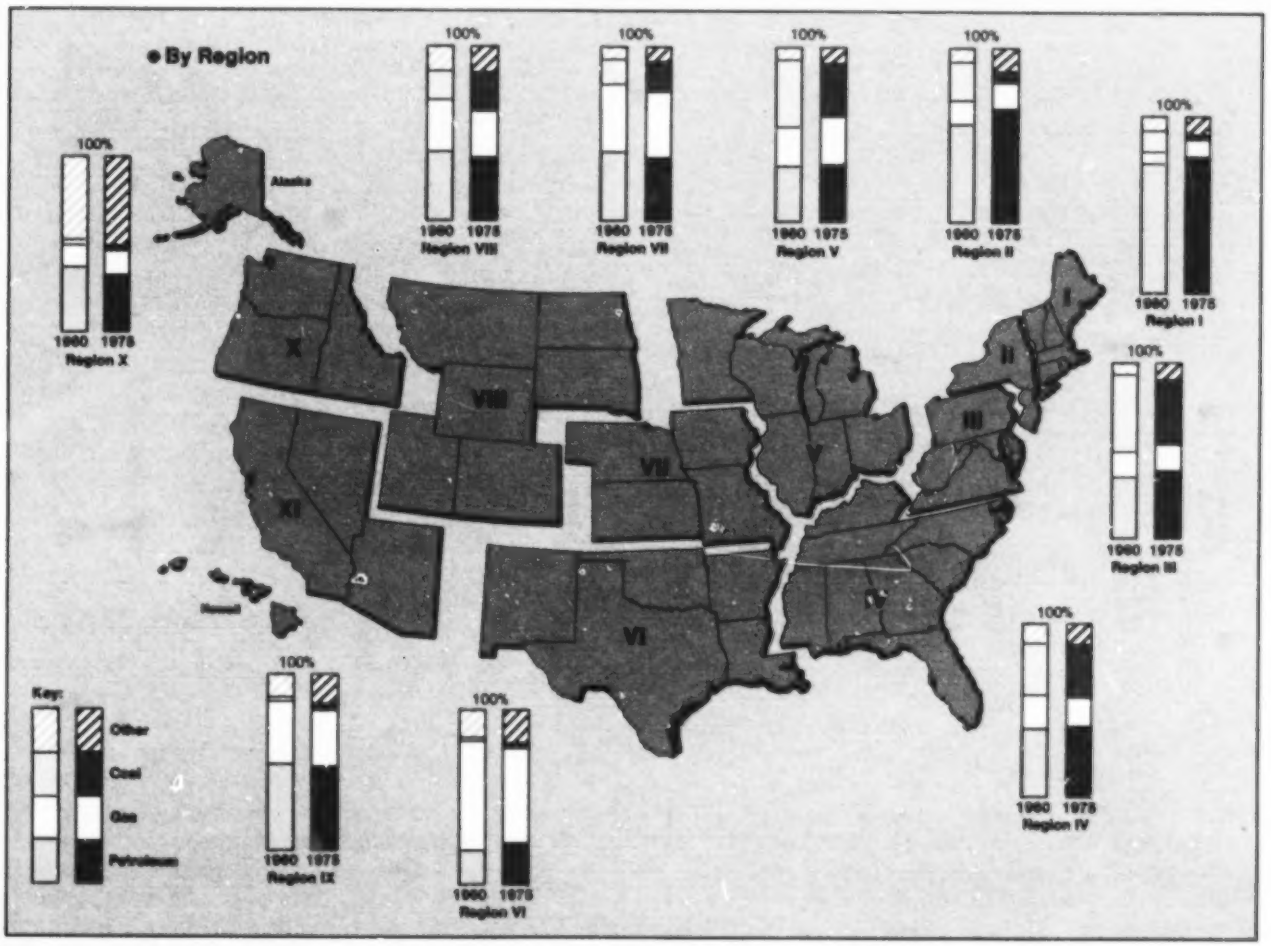
Consumption of Energy

interwoven with the future course of economic activity. For example, business in general, in an effort to minimize use of expensive energy, has shifted somewhat from capital-intensive production processes to labor-intensive processes. And yet, in so doing, the potential for improvements in labor productivity has been diminished. In another example, it might be desirable to switch from expensive, imported oil to cheaper, domestic coal, yet concerns about how much of coal's high sulfur content would escape into the atmosphere may preclude that move.

Ken Goldstein

SOURCES: *Energy in the American Economy,* by Sam Schurr for The Resources For the Future (The Johns Hopkins University Press); Bureau of Economic Analysis; The Department of Energy; The Conference Board.





ECONOMIC ROAD MAPS

Eva Culen, Editor — Chuck N. Tow, Lead Chartist

Prepared in The Business Conditions Analysis Department—Lora S. Collins, Director
Prices for Quantities of this chart will be supplied on request to Information Service.

Published by
THE CONFERENCE BOARD
845 Third Avenue, New York, N.Y. 10022

THE CONFERENCE BOARD IN CANADA
25 McArthur Road
Ottawa, Ontario, K1L-6R3, Canada

THE CONFERENCE BOARD IN EUROPE
Avenue Louise, 326 - Bte 48
B-1050 Brussels, Belgium